Chapter 2

Claims

Claims 1-39 (canceled)

Claim 40 (New) What is claimed is the improved method of using a computer to calculate scenarios of economic variables where the old method of using a computer to generate economic scenarios consists of

a. entering data related to the stochastic process parameters into the computer using one of a plurality of a text editor, computer interface, disk, file, computer memory, external source, (or electronic means)

b. state variable generation on the computer, which consists of the steps of one of a plurality of initializing needed memory and using previously initialized memory, iterating over said scenarios using one of a plurality

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of computer memory and computer readable media

1. wherein a scenario consists of a loop over time nodes,

2. wherein at each time node the state variables are advanced by the
   steps of

   i. calculating the expected change vector in the state variables,

   ii. calculating the random change by

      A. obtaining the deviates from one of a plurality of values
         stored in memory, values in a file, pseudo random gener-
         ation with the processor of the computer, quasi random
         monte carlo generation with the processor of the com-
         puter,

      B. multiplying the vector of deviates by a matrix in computer
         memory,

      C. adding the expected and unexpected change vectors to get
         the total change vector,

iii. adding the total change vector to the old state vector to get

the new state vector

and the improved method consists of

c. entering data related to the stochastic process parameters into the computer using one of a plurality of a text editor, computer interface, disk, file, computer memory, external source, (or electronic means)

d. entering the parameters of the regime process through one of a plurality of of a text editor, computer interface, disk, file, computer memory, external source, (or electronic means)

one of a plurality of

1. specifying the initial regime and state variable,

2. calculating with the computer processor the initial state variables given one of a plurality of an initial regime communicated to the computer memory,

3. calculating both the initial regime and the initial state variables using the computer processor,

e. state variable generation on the computer, which consists of the steps of one of a plurality of initializing needed memory and using previously initialized memory, iterating over said scenarios using one of a plurality of computer memory and computer readable media

1. wherein a scenario consists of a loop over time nodes,

2. wherein at each time node the state variables are advanced by the steps of

i. first determine a regime index by one of a plurality of use a regime index for this time node step previously calculated in memory based on the regime transition probability matrix and the previous regime index and random selection of the regime index in accordance with the regime transition probabilty matrix and the previous regime index

ii. then the state variables are advanced by the steps of calculating the expected change vector in the state variables using the regime index to select the parameters in this calculation,

iii. calculating the random change by

    A. obtaining the deviates from one of a plurality of values stored in memory, values in a file, pseudo random generation with the processor of the computer, quasi random monte carlo generation with the processor of the computer,

    B. multiplying the vector of deviates by a matrix whose elements are determined by use of the regime index to select among the parameters used to calculate the matrix in computer memory,

    C. adding the expected and unexpected change vectors to get the total change vector,

iv. adding the total change vector to the old state vector to get

the new state vector

wherein there are at least two distinct regimes in that the parameter sets differ by at least one parameter in the two regimes and at least one parameter relating to a variable used to calculate a rate and one parameter relating to a variable used to calculate an equity variable have values that are different in at least two regimes.   ♠

Claim 41 (New) The method of claim 40 further comprising where a general financial variable is calculated by the computer using the regime switching economic scenarios to calculate on the computer a variable used to calculate a financial payment.   ♠

Claim 42 (New) The method of claim 41 further comprising wherein said financial payment is used to execute a financial transaction.   ♠

Claim 43 (New) The method of using a computer for the generation of regime switching economic scenarios comprising the steps of

means for generating regime scenarios of a regime at each time node in each scenario

means for generating state variable scenarios using the regime scenarios so generated at each time node in each scenario,

wherein the regime index at said time node in said scenario is used to select a set of parameters that include the parameters of the Double Mean Reverting Process model as a subset and said parameters are used to calculate the value of the state variables at the next time node. ♠

Claim 44 (New) The method of claim 43 further comprising means for calculating auxiliary data using the regimes and economic state variables so generated at each time node in each scenario. ♠

Claim 45 (New) The method of claim 43 further comprising means for statistical analysis of the scenarios. ♠

Claim 46 (New) The method of claim 43 further comprising using the regime index at each time node and the state variables at each time node to interpolate a value on a grid of dimension less than or equal to the number of state variables of one of a plurality of price grid, yield grid, financial variable

grid, grid of a variable used in a financial transaction, and grid of a variable

used to calculate a financial payment.   ♠

Claim 47 (New) The method of claim 46 further comprising wherein said

financial payment is used to execute a financial transaction.   ♠

Claim 48 (New) The method of using a computer for the generation of

regime switching economic scenarios comprising the steps of

    means for generating regime scenarios of a regime at each time node in

each scenario

    means for generating state variable scenarios using the regime scenarios

so generated at each time node in each scenario,

    wherein the regime index is used to select a set of data and said data

together with the state variables at a time node in a scenario are used to

calculate the value of a variable at said time node in said scenario.   ♠

Claim 49 (New) The method of claim 48 further comprising means for

calculating auxiliary data using the regimes and economic state variables so

generated at each time node in each scenario   ♠

Claim 50 (New) The method of claim 48 further comprising using the regime index at each time node and the state variables at each time node to interpolate a value on a grid of dimension less than or equal to the dimension of the state vector of one of a plurality of price grid, yield grid, financial variable grid, grid of values used in a financial transaction, and grid of a variable used to calculate a financial payment. ♠

Claim 51 (New) The method of claim 50 further comprising using the Green's function numerical method to calculate a set of grid values. ♠

Claim 52 (New) The method of claim 51 further comprising where the short term interest rate is calculated from one of a plurality of the an affine function of the state variables, a quadratic function of the state variables, an exponential function of one of the state variables, and a polynomial function of the state variables of degree higher than two. ♠

Claim 53 (New) The method of claim 52 further comprising wherein said financial payment is used to execute a financial transaction. ♠

Claim 54 (New) The method of using a computer for the generation of

regime switching economic scenarios comprising the steps of

   means for generating regime scenarios of a regime at each time node in

each scenario

   means for generating state variable scenarios using the regime scenarios

so generated at each time node in each scenario,

   wherein the short term interest rate is calculated as the exponential of

one of the state variables.   ♠

Claim 55 (New) The method of claim 54 further comprising means for

calculating auxiliary data using the regimes and economic state variables so

generated at each time node in each scenario   ♠

Claim 56 (New) The method of claim 54 further comprising using the

regime index at each time node and the state variables at each time node to

interpolate a value on a grid of dimension less than or equal to the number of

state variables of one of a plurality of price grid, yield grid, financial variable

grid, grid of a variable used in a financial transaction, and grid of a variable

used to calculate a financial payment.   ♠

Claim 57 (New) The method of claim 56 further comprising wherein said

financial payment is used to execute a financial transaction.   ♠